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Title:

ELECTRONIC MAIL BROADCASTING SYSTEM

Related Applications

This is a continuation-in-part application of Serial No. 292,319, filed December 30, 1988, entitled Electronic Communication System; and
5 assigned to the same assignee as this application.

Background of the Invention

This invention relates to communications systems, and particularly to electronic mail systems having the capability of "broadcasting" the same
10 document to a number of users.

Initially electronic mail systems furnished services between dedicated terminal devices. These were slow and cumbersome, and could reach only a limited number of other devices. The
15 growth in the use of personal computers and facsimile machines established new potential for the expansion in the number of terminals, and allowed transmission of more complex data than was hitherto reasonably and inexpensively possible. However, the
20 incompatibilities between various systems limited each terminal's "reach", i.e. the number of devices with each terminal could communicate.

Standardization of facsimile equipment fueled an explosion in the number of machines
25 available to send and receive documents, messages

and data. Nevertheless, the various data transmission systems have remained substantially incompatible. For example, personal computers cannot send business documents to facsimile machines in a cost effective, convenient way. The types of word processing programs available on personal computers remain incompatible.

The aforementioned application discloses a system that overcomes these difficulties and increases the compatibility of these devices by coupling widely scattered facsimile machines, personal computers (PC), and telex machines to a service center, furnishing the personal computers with means for compressing data to be transmitted and for expanding data to be received, and providing the central office with facilities for expanding and converting data and transmitting received in suitable form to the telex, PC, and facsimile machines.

Such facilities are effective for transmission of individual messages to one or more receivers. However, when attempts are made to "broadcast" a document from one source to a large number of recipients the disclosed system becomes cumbersome because such broadcasting involves separately arranging for transmission of each document to each recipient.

Objects and Summary of the Invention

An object of the invention is to overcome this difficulty.

Another object is to furnish an efficient system for broadcasting a document to a large number of recipients from a single facsimile, PC, or other machine.

According to a feature of the invention, these objects are attained in whole or in part by electronically storing the document which a service center receives from a subscriber, forming an electronic transaction list from an electronic addressee list and from sender data which a service center receives with the document as part of a broadcast subscribers message, and sequentially transmitting each electronic address-data entry on the transaction list the data in the document according to dialing instructions in each entry to the addresses on the list.

These and other features of the invention are pointed out in the claims. Other objects and advantages of the invention will become evident from the detailed description when read in light of the following drawing.

Brief Description of the Drawings

Fig. 1 is a block diagram of a system embodying features of the invention.

Figs. 2 to 4 are flow diagrams of operations in the service center of Fig. 1 for transmitting broadcast documents accordingly.

Fig. 5 is a diagram illustrating a broadcast fax, a broadcast electronic address, an entry in a transaction list, and the flow of data therein as effected in Figs. 1 to 4.

10 Detailed Description of Preferred Embodiments

In Fig. 1, a telephone link or other utility link UL connects a service center SC to a number of personal computers or PCs P1, P2, P3, etc., facsimile machines or faxes F1, F2, F3, etc., and telex machines T1, T2, T3, etc., placed at various locations throughout the world. According to an embodiment of the invention the link UL represents the facilities of a public telephone company which connects its customers on the basis of dialed telephone numbers. Each PC, fax, and telex may either be a subscriber to the services of the service center SC or a potential recipient of messages from subscribers. The subscriber owning PC P1 may for example place PC P1 in New York. The PC P2 may be in Washington, PC P3 in Tokyo, and PC P4

in London. The subscribers of fax F1 may keep the machine in Chicago, fax F2 in San Francisco, and fax F3 in Rome. The service center SC resides, for example in New Jersey.

5 The service center generally receives ordinary or compressed data from its PC, facsimile, and telex subscribers in various formats and converts incoming data by compression, expansion, etc. to word processing data or fax imaged data for
10 receipt by a PC or printing by a facsimile machine.

 The portions of the service center SC shown in Fig. 1 illustrate the means for broadcasting facsimile documents from one fax machine to a number of fax machine from 2 to perhaps
15 1000 or more. For this purpose, the service center SC includes a fax-in group controller IGC that temporarily stores an incoming broadcast fax from a fax machine such as FAX 1 and routes it to a routing processor RP. A data base DB in the center SC
20 stores information concerning each of the subscribers, such as the subscriber's name, address, facsimile number, identification number, etc. The data base DB may also store an image copy of the subscriber's letterhead so that messages coming from
25 the subscriber without a letterhead may have the letterhead combined therewith. If the subscriber is a frequent or regular broadcaster to other facsimile machines, the data base DB preferably also stores a set of electronic addresses of each of the
30 recipients. Furthermore, the data base DB contains

substantial other information including prototypes of cover sheets sent with facsimiles as well as clock and time information.

5 The routing processor RP validates any transaction with the data base identification and adds default information to the document. A message control processor MCP retrieves such information as the broadcast list or electronic address list, the letterhead, the cover sheet prototype, etc. from the
10 data base DB and the routing processor RP and delivers the information to a fax delivery controller FDC. The latter then selects one or more output lines OL from one or more fax-out line group controllers OGC1, OGC2,....OGCn, which transmit the
15 information through the utility link UL to the designated facsimile machines F1, F2....Fn. The OGCs each include several facsimile boards to connect to the output lines OL.

20 Each of the members IGC, RP, MCP, DB, FDC, and OGC, in the service center SC are in the form of a computer, such as a personal or desk top computer, whose power may vary with its function.

25 The equipment operates in accordance with the flow charts shown in Figs. 2 to 4. As shown in block 20 the service center SC receives the broadcast fax in the form of the document to be broadcast and the broadcast electronic address (BCEA) which includes a list of recipients or identifies a list of recipients in the service

center's data base DB. A sample of the data in a FAX(a) with a sample electronic document DOC and the data in a sample BCEA appear in Fig. 5. The BCEA contains the subscriber's name, subscriber's
5 letterhead, the broadcast fax cover sheet, the priority at which the broadcast is to go, and the list of recipients, etc. As shown at block 22 in Fig. 2, the fax-in group controller IGC temporarily stores the document and BCEA received through the
10 utility link UL. The subscriber accesses the center SC and the control IGC through utility link UL by dialing in the usual manner.

As shown in block 24 of Fig. 2, the routing processor RP places the transaction in a
15 queue with earlier transactions received from other subscriber facsimiles. In block 26, the routing processor RP validates the transaction by comparing the subscriber's ID and other BCEA information with the data base DB. As shown by decision block 28,
20 the routing processor asks whether the transaction of block 28 is valid. If the transaction is not valid, as shown by block 29, the routing processor takes the transaction out of queue and in block 30 sends an error message to the subscriber's facsimile
25 through the utility link UL to ask for resubmission of the document and the BCEA.

In block 32, if the transaction is valid, the routing processor adds default information about the subscriber from the data base to the BCEA. The
30 default information DI is shown in Fig. 5 and may

include billing data and a prototype table for a cover sheet. The addition of the default information to the BCEA also appears in Fig. 5.

The routing processor RP then routes the
5 accumulated information to the message control processor MCP in Fig. 3. Here at step 34, the message control processor MCP retrieves and stores the recipient list LIST, the subscriber's letterhead, the subscriber's cover sheet, and
10 prototype information as specified in BCEA. Fig. 5 illustrates one example EA(n) of the electronic addresses EA in the list LIST. Each electronic address is identified as EA(n), where $n = 1, 2, 3, \dots$

The message control processor MCP routes
15 the gathered information to the fax delivery controller FDC, which in step 36 merges the selected information from the BCEA and LIST to form a transaction list (XLIST) of routing entries. Each routing entry is identified as XLIST(n), where $n =$
20 1, 2, 3, Fig. 5 illustrates the merger of the information from the BCEA and an electronic address EA(n) to prepare one routing entry XLIST(n) in the XLIST. The term routing entry or XLIST(n) is used to refer to all information, i.e. Fax dialing
25 number, Ref., Coversheet, Start time, and other information, for one addressee on the list XLIST. An entry may be considered a routing package.

In 38, the fax delivery controller FDC merges the letterhead with the document to create a

final document image. It asks at decision 40 whether there exist more routing entries XLIST(n) on the list XLIST. Assuming that more routing entries exist, the fax delivery controller FDC, in step 42, 5 selects a free line in a free out-fax line group controller OGC, preferably an OGC that has already received a routing entry XLIST(n) from this transaction list. In block 43 it then sends the selected routing entry from XLIST to the selected 10 line in the selected out-fax group controller OGC. If there is another free line, the controller FDC sends the next entry XLIST(n) to the same or other selected OGC. The controller FDC sends the entries to the free lines one at a time as the lines become 15 free.

As shown in block 46, of Fig. 4, each out-fax line group controller OGC selected determines if this is the first occurrence of this broadcast in that OGC. In the decision of step identified as 48, 20 if the answer is yes, that line group controller OGC retrieves and stores a copy of the document image (document with letterhead) and the cover sheet from the message control processor MCP and fax delivery controller FDC and continues. If the answer is no, 25 the step of retrieving and storing the copy of the document is skipped. The document is stored only once per broadcast per OGC.

In step 52, a group controller OGC merges each received routing entry XLIST(n) on the 30 XLIST with the cover sheet CS to create a

transmission cover sheet TCS(n) for the selected routing entry XLIST(n). Each group controller performs this step.

5 In the step identified as 54, the group controller OGC(n), for each selected line in that OGC, dials according to the dialing instructions in each routing entry XLIST(n), accesses and transmits the cover sheet TSC (n) for the selected routing entry and then the document image (document and
10 letterhead). Each selected group controller performs this function as it receives the necessary data.

In any group controller OGC the document image is stored only once for each broadcast. The
15 document is accessed, and its content transmitted, repeatedly, namely once after each transmission coversheet TSC(n). In the TCS, each routing entry or routing package XLIST(n) routes the document and cover sheet, i.e. routes the content of the document
20 and coversheet, to the correct addressee on a selected line. The output group controller OGC then routes a signal to C at step 40 in Fig. 3.

At step 40, the controller FDC asks if there are any more entries on the XLIST. If yes, it
25 proceeds to 42. If not, it prepares and sends a customer report (at 68) which includes a list of addresses for successfully transmitted documents. It then purges (at 70) the distributed files from the controller OGC.

While embodiments of the invention have been described in detail, it will be evident to those skilled in the art that the invention may be embodied otherwise.

What is claimed is:

1. A system for broadcasting a document to a plurality of facsimile machines, comprising:

5 first storage means for storing the document;

second storag means for storing a list of entries each having electronic addresses for an addressee and each having dialing instructions for an adressee as well as addressee-variable
10 information;

transmission means for transmitting the entries and the document, one entry at a time with the data in the document, on the basis of the dialing instructions in the entries.

15 2. The method of broadcasting a document from a sender comprising:

storing the document;

forming an electronic routing entry list from an electronic address list as well as sender
20 and receiver data including dialing instructions;

and sequentially transmitting each electronic entry and the entry list according to dialing instructions in each entry to the addresses on the entry list.

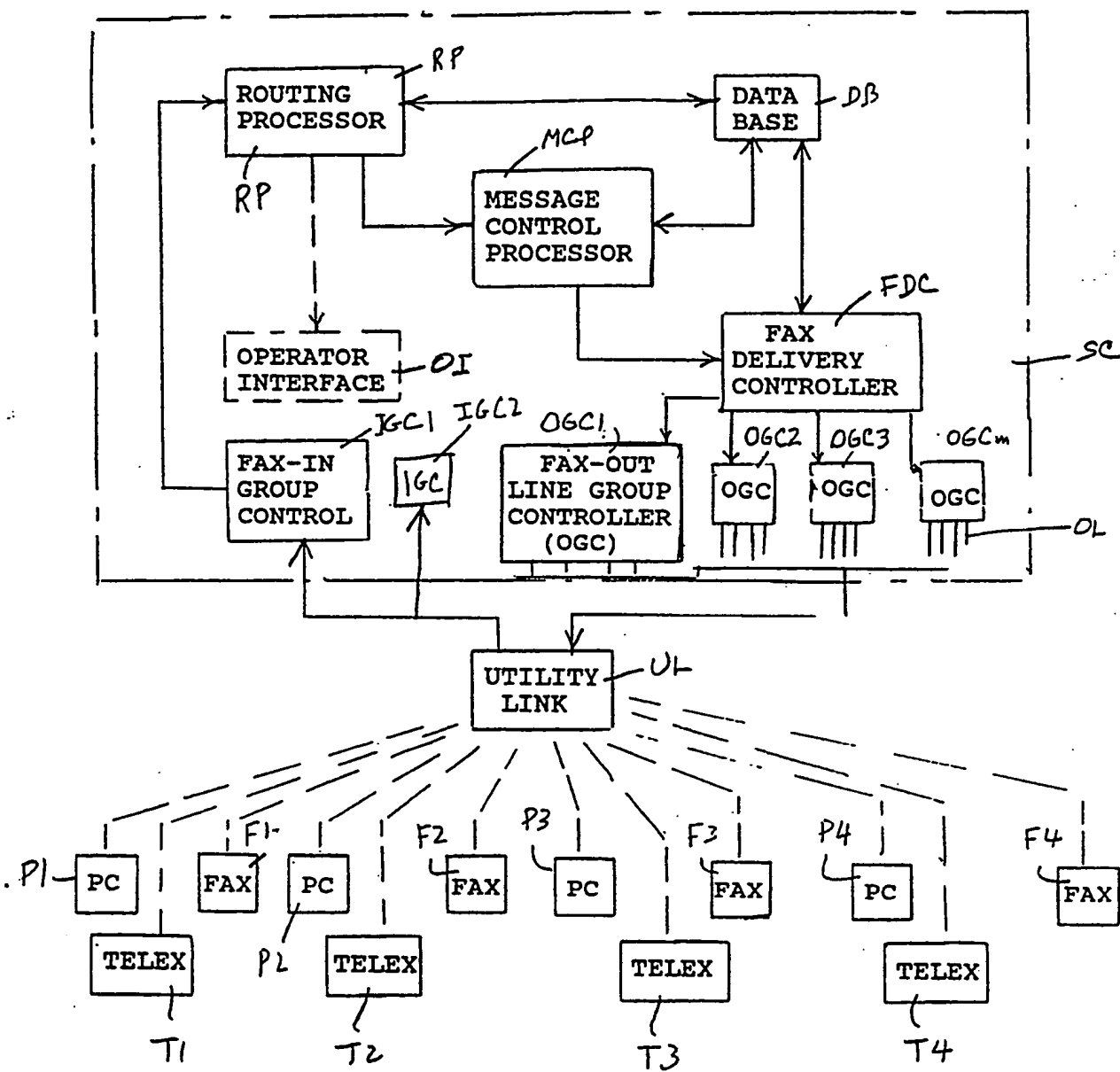
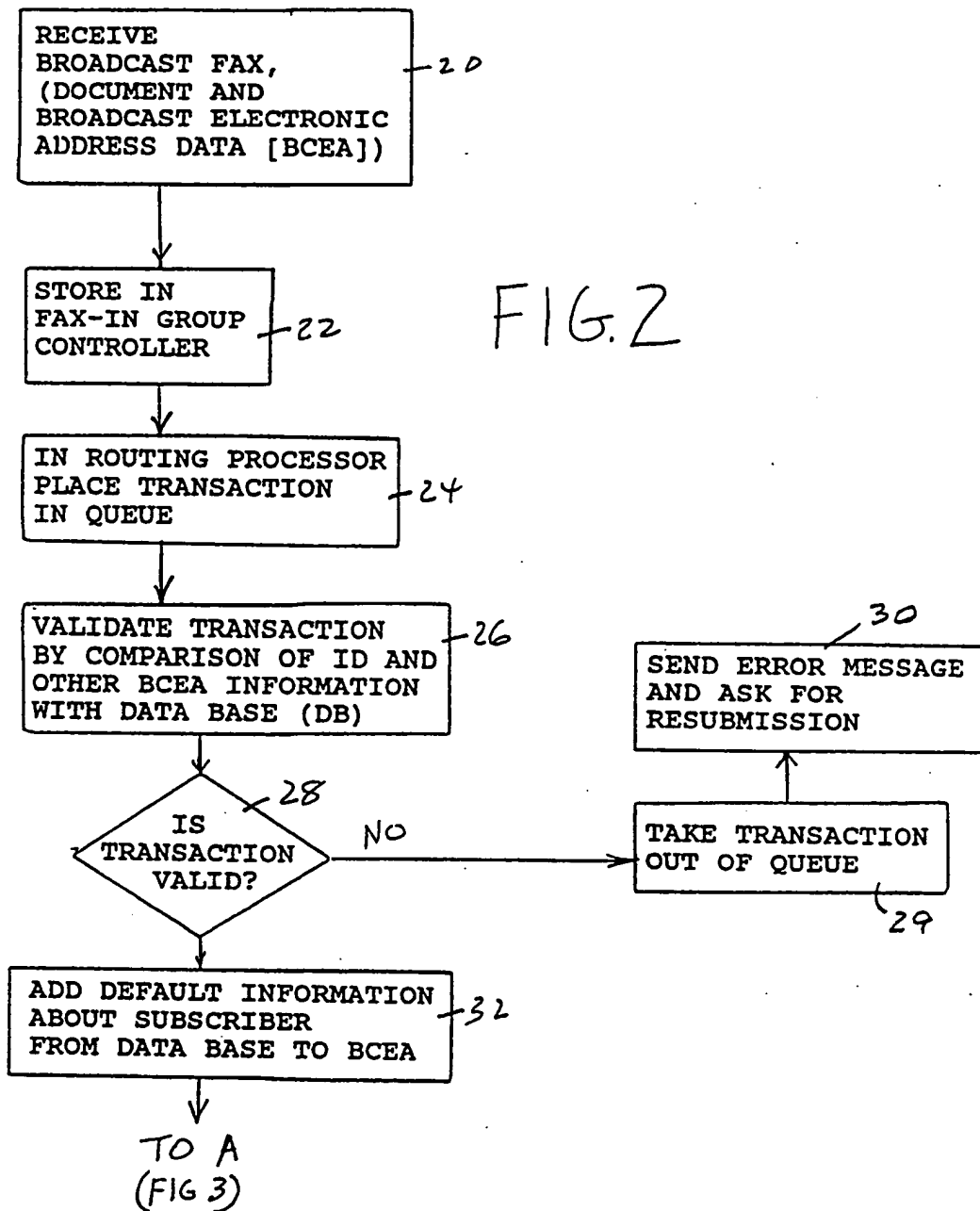


Fig 1



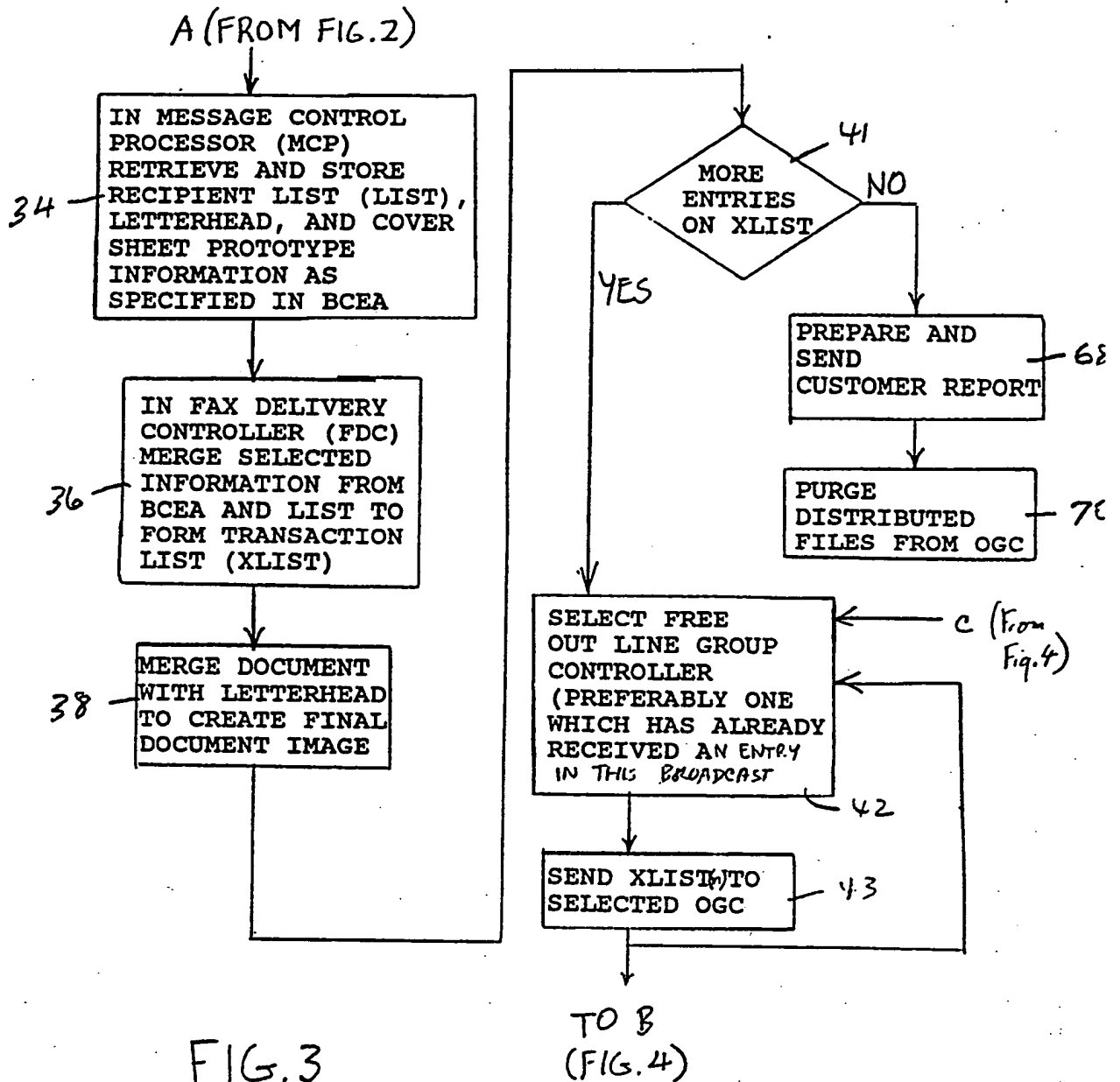
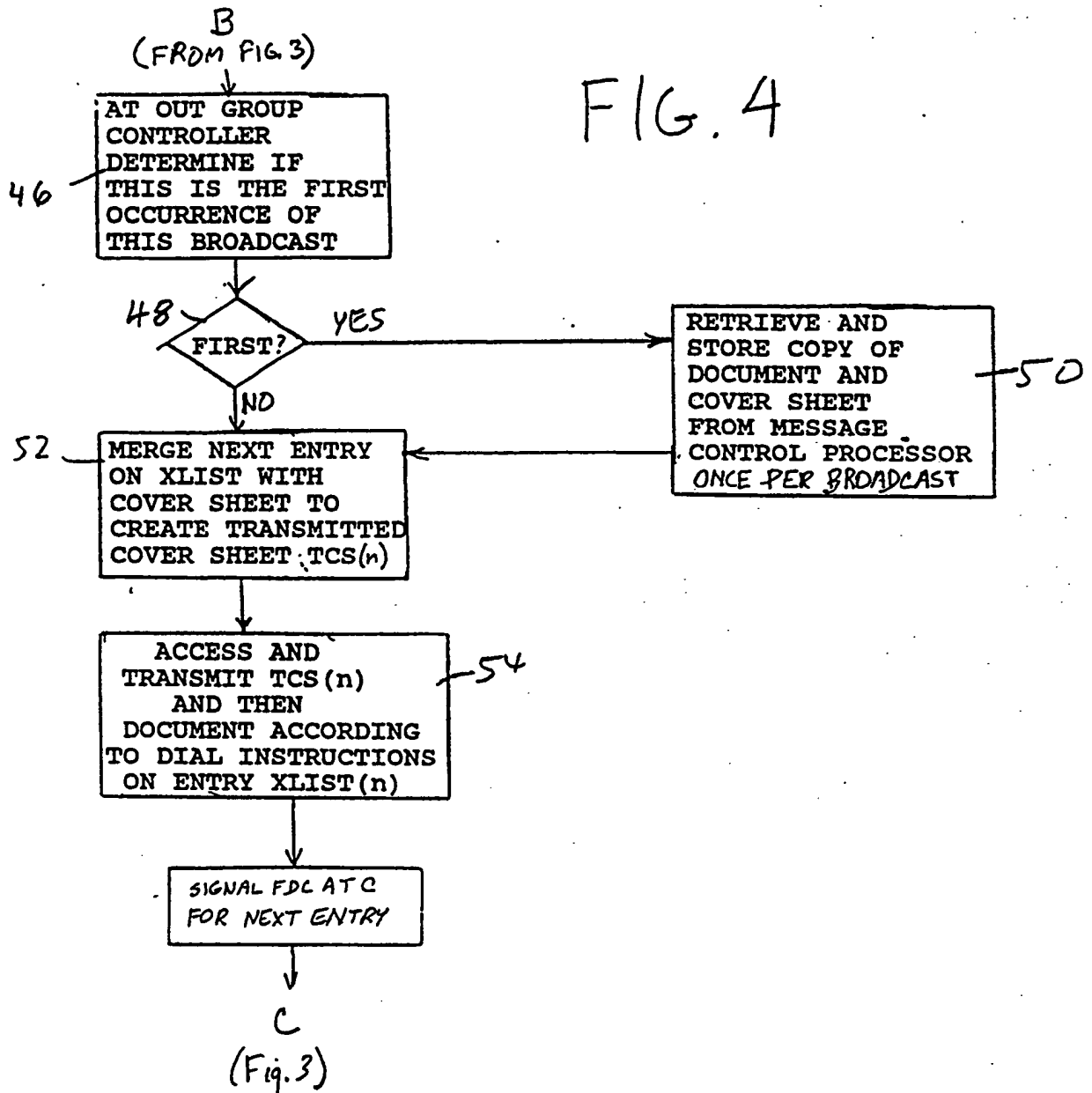


FIG. 4



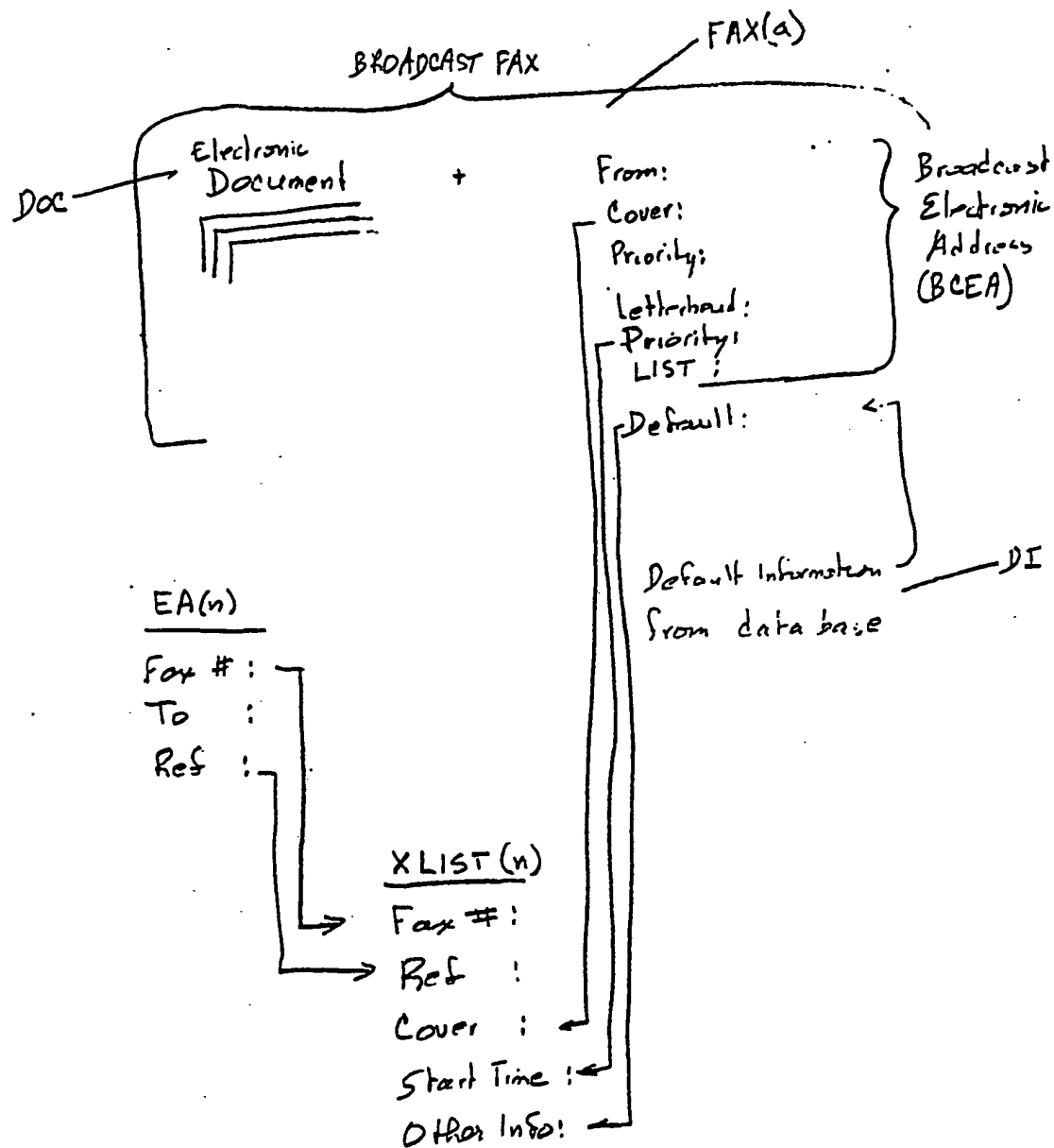


FIG. 5

INTERNATIONAL SEARCH REPORT

International Application No PCT/US 90/04184

| I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁵ : H 04 N 1/32 | | | | | | | | | | | | | | |
|---|---|-------------------------------------|---|--|-------------------------------------|-------------|--|---------------------------------|------------------------|--|---|---|---|---|
| II. FIELDS SEARCHED <div style="text-align: right; font-size: small;">Minimum Documentation Searched ⁷</div> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%; border-bottom: 1px solid black; font-size: small;">Classification System</td> <td style="border-bottom: 1px solid black; font-size: small;">Classification Symbols</td> </tr> <tr> <td style="height: 40px; vertical-align: top; border: 1px solid black;">IPC⁵</td> <td style="border: 1px solid black;">H 04 N 1/00</td> </tr> </table> <div style="text-align: center; font-size: x-small; margin-top: 10px;"> Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched ⁸ </div> | | | Classification System | Classification Symbols | IPC ⁵ | H 04 N 1/00 | | | | | | | | |
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| IPC ⁵ | H 04 N 1/00 | | | | | | | | | | | | | |
| III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <th style="width: 10%;">Category ¹⁰</th> <th style="width: 70%;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 20%;">Relevant to Claim No. ¹³</th> </tr> <tr> <td style="text-align: center; vertical-align: top;">X</td> <td>EP, A, 0117871 (FUJITSU) 12 September 1984 see page 3, line 3 - page 4, line 19 --</td> <td rowspan="4" style="text-align: center; vertical-align: top;">1,2</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>EP, A, 0053469 (OKI) 9 June 1982 see page 9, line 3 - page 13, line 3 --</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>NEC Research of Development, no. 90, July 1988, (Tokyo, JP), N. Asano et al.: "Facsimile mail system", pages 117-126 --</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td>DE, A, 3035139 (RICOH) 19 March 1981 -----</td> </tr> </table> | | | Category ¹⁰ | Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹² | Relevant to Claim No. ¹³ | X | EP, A, 0117871 (FUJITSU) 12 September 1984 see page 3, line 3 - page 4, line 19 -- | 1,2 | A | EP, A, 0053469 (OKI) 9 June 1982 see page 9, line 3 - page 13, line 3 -- | A | NEC Research of Development, no. 90, July 1988, (Tokyo, JP), N. Asano et al.: "Facsimile mail system", pages 117-126 -- | A | DE, A, 3035139 (RICOH) 19 March 1981 ----- |
| Category ¹⁰ | Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹² | Relevant to Claim No. ¹³ | | | | | | | | | | | | |
| X | EP, A, 0117871 (FUJITSU) 12 September 1984 see page 3, line 3 - page 4, line 19 -- | 1,2 | | | | | | | | | | | | |
| A | EP, A, 0053469 (OKI) 9 June 1982 see page 9, line 3 - page 13, line 3 -- | | | | | | | | | | | | | |
| A | NEC Research of Development, no. 90, July 1988, (Tokyo, JP), N. Asano et al.: "Facsimile mail system", pages 117-126 -- | | | | | | | | | | | | | |
| A | DE, A, 3035139 (RICOH) 19 March 1981 ----- | | | | | | | | | | | | | |
| <div style="display: flex; justify-content: space-between; font-size: x-small;"> <div style="width: 45%;"> <p>* Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p> </div> </div> | | | | | | | | | | | | | | |
| IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border-bottom: 1px solid black; font-size: small;">Date of the Actual Completion of the International Search</td> <td style="width: 50%; border-bottom: 1px solid black; font-size: small;">Date of Mailing of this International Search Report</td> </tr> <tr> <td style="text-align: center;">16th November 1990</td> <td style="text-align: center;">19.12.90</td> </tr> <tr> <td style="border-bottom: 1px solid black; font-size: small;">International Searching Authority</td> <td style="border-bottom: 1px solid black; font-size: small;">Signature of Authorized Officer</td> </tr> <tr> <td style="text-align: center;">EUROPEAN PATENT OFFICE</td> <td style="text-align: center;">F.W. HECK </td> </tr> </table> | | | Date of the Actual Completion of the International Search | Date of Mailing of this International Search Report | 16th November 1990 | 19.12.90 | International Searching Authority | Signature of Authorized Officer | EUROPEAN PATENT OFFICE | F.W. HECK | | | | |
| Date of the Actual Completion of the International Search | Date of Mailing of this International Search Report | | | | | | | | | | | | | |
| 16th November 1990 | 19.12.90 | | | | | | | | | | | | | |
| International Searching Authority | Signature of Authorized Officer | | | | | | | | | | | | | |
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**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

US 9004184

SA 39461

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 11/12/90
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| | | JP-A- 59040768 | 06-03-84 |
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